

REMARKS

Applicants respectfully request favorable consideration and allowance of the pending claims.

I. Status of the Claims

Upon entry of this amendment, claims 1, 2, and 6-35 remain pending, while claims 7-13 and 15-35 are withdrawn from consideration. Claims 3, 4, and 5 have been canceled.

Claims 1, 6, 7, and 11-14 have been amended. Support for the minimum and maximum concentrations of zinc, iron, and nickel may be found in the published application at paragraphs [0028], [0033], [0036], and [0037]. Applicants have amended withdrawn claims in addition to claims under consideration to make all of the claims which depend from claim 1 consistent with the amendments to claim 1.

II. Elections/Restrictions

Applicants elected the claims of Group I, Species 2, and Species 2d, encompassing claims 1-6 and 14. The amendments to the claims are consistent with the elections. Pending claims 1, 2, and 6 of Group I remain generic claims. The amendment to claim 14 limiting the zinc concentration to between 15 and about 30 atomic percent is consistent with the election of Species 2d since Species 2d encompassed a broader zinc concentration range from 10 to 30 atomic %.

III. Claim Rejections Under 35 U.S.C. §102(b)

Reconsideration is requested of the rejection of claims 1-6 and 14 as being anticipated by JP 52084193 by Ichikawa and the rejection of claims 1-6 as being anticipated by U.S. 4,100,180 also by Ichikawa et al.

Claim 1 is directed to an alloy for use as a catalyst in oxidation or reduction reactions, the alloy comprising:

- platinum at a concentration that is between about 10 and about 80 atomic percent,
- zinc at a concentration that is between about 15 atomic % and about 70 atomic %, and
- at least one of nickel and iron at a concentration that is between about 20 atomic % and about 80 atomic %.

The alloy defined by claim 1 therefore requires significant concentrations of both a) zinc and b) nickel or iron.

The alloys, the components, and the component concentration ranges disclosed in both of the cited references are identical such that if the claims are patentable over one reference, they are patentable over both. The assignee of the applicants' present application is a Japanese corporation, and the assignee's general counsel, who is fluent in Japanese, has reviewed the JP 52084193 reference and has asserted that the alloy concentration ranges disclosed in the respective references are identical. For example, JP 52084193 discloses a catalyst comprising 22 to 98 wt.% platinum, 1.5 to 70 wt.% iron, and 0.5 to 8 wt.% zinc on page 490, upper-left column, lines 6-15 of JP 52084193. This description in JP 52084193 describes the same alloy, components, and component concentration ranges as the description of column 3, lines 1-14 of US 4,100,180.

The following table shows the *broadest* possible concentration ranges of each element in the catalyst, stated in terms of atomic %, disclosed in the cited references. Applicants respectfully submit that the Office's calculations converting the concentrations of the alloy components from weight % to atomic % are in error -- in fact, the calculations

must be incorrect since the asserted concentration range of iron from 2.6 to 125 atomic % is impossible (a material cannot have any more than 100% of any particular element). The concentration ranges shown in this table are accurate:

Ranges Based on Broadest Disclosure

Element	Low (Atomic %)	High (Atomic %)
Iron	4.38	88.75
Zinc	0.54	19.96
Platinum	7.58	93.57

The preferred concentrations of the components of the alloy are stated to be 1.5 to 50 wt.% iron, 2.5 to 7 wt.% zinc, and 43 to 96 wt.% platinum. The broadest possible concentrations ranges, stated in terms of atomic %, of the preferred alloys of the Ichikawa references are set forth in the following table:

Ranges Based on Preferred Disclosure

Element	Low (Atomic %)	High (Atomic %)
Iron	4.45	76.06
Zinc	3.25	17.76
Platinum	18.03	88.32

Applicants have further calculated the concentrations of each component in terms for atomic % for each Example disclosed in JP 52084193 and U.S. 4,100,180. In each example, Ichikawa et al. disclosed an "iron retention" and a "zinc retention." These values were stated in % by weight. Applicants have converted the % by weight to the atomic % values shown in this table:

Compositions of Examples

Example	Iron (atomic %)	Zinc (atomic %)	Platinum (atomic %)
1	7.16	14.27	78.57
2	7.72	14.21	78.06

Comparative 1	14.62	13.69	71.70
Comparative 2	1.38	0	98.62
Comparative 3	2.27	8.31	89.42
3	12.35	13.49	74.16
4	7.52	12.85	79.63
Comparative 4	3.20	9.03	87.76
Comparative 5	3.23	20.35	76.42
Comparative 6	10.06	22.53	67.41
Comparative 7	1.86	15.08	83.06
Comparative 8	4.74	25.25	70.01
Comparative 9	13.85	0	86.15
5	4.59	13.84	81.57
6	69.66	6.83	23.51
7	13.11	13.63	73.26
8	8.47	6.17	85.36
9	31.83	2.04	66.13
10	30.54	6.19	63.27
11	29.31	10.15	60.54
12	7.16	14.27	78.57
13	7.16	14.27	78.57

Patentability based on anticipation of ranges is governed by MPEP §2131.03. MPEP §2131.03 Part I applies when a disclosed alloy actually falls within the claimed range -- this is not the case herein, since none of the specific alloys disclosed in either cited reference comprise zinc and iron wherein the zinc concentration is at least 15 atomic % **and** the iron concentration is at least 20 atomic %.

MPEP §2131.03 Part II applies when the prior art range touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed:

II. PRIOR ART WHICH TEACHES A RANGE OVERLAPPING OR TOUCHING THE CLAIMED RANGE ANTICIPATES IF THE PRIOR ART RANGE DISCLOSES THE CLAIMED RANGE WITH "SUFFICIENT SPECIFICITY"

When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case

by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute."

Herein, MPEP §2131.03 Part II applies since the prior art discloses an alloy comprising platinum, zinc, and iron and the claims are directed to an alloy comprising platinum, zinc, and at least one of nickel or iron. In their broadest possible embodiments, the alloys disclosed in the cited references comprise platinum at a concentration ranging from 7.58 to 93.57 atomic %, zinc at a concentration from 0.54 to 19.96 atomic %, and iron at a concentration from 4.38 to 88.75 atomic %. In the broadest possible *preferred* embodiments, the alloys disclosed in the cited references comprise platinum at a concentration ranging from 18.03 to 88.32 atomic %, zinc at a concentration from 3.25 to 17.76 atomic %, and iron at a concentration from 4.45 to 76.06 atomic %. The claims require the platinum concentration range from 10 to 80 atomic %, the zinc concentration from 15 atomic % to 70 atomic %, and the at least one of nickel or iron concentration ranges from 20 atomic % to 80 atomic %. Since there is some overlap among the concentration ranges and since none of the specific alloys disclosed in the references meet all of the limitations of the claims, MPEP §2131.03 Part II applies, and anticipation is determined on a case-by-case basis.

Anticipation under the standard set forth in MPEP §2131.03 Part II may be found when the claimed subject matter is disclosed in the reference with "sufficient specificity" to constitute anticipation under the statute. MPEP §2131.03 Part II provides guidance as to what constitutes "sufficient specificity":

What constitutes a "sufficient specificity" is fact dependent. If the claims are directed to a narrow range, and the reference teaches a broad range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. See, e.g., *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory. Further, while there was a slight overlap between the reference's preferred range (150-350 degrees C) and the claimed range, that overlap was not sufficient for anticipation. "[T]he disclosure of a range is no more a disclosure of the end points of the range than it is each of the intermediate points." *Id.* at 1000, 78 USPQ2d at 1424. Any evidence of unexpected results within the narrow range may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See **MPEP § 2131.02**. A **35 U.S.C. 102/ 103** combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a **reasoned* statement regarding obviousness. *Ex parte Lee*, 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board). For a discussion of the obviousness of ranges see **MPEP § 2144.05**.

Therefore, under the Federal Circuit's *Atofina* rubric endorsed in the MPEP, anticipation can be found only if the broad concentration ranges or the preferred concentration ranges disclosed in the cited references describe applicants' alloys with sufficient specificity. MPEP §2131.03 Part II cites the *Atofina* case for an illustration of a fact dependent analysis. In *Atofina*, the court held that neither the reference's broad temperature range of 100-500°C that completely encompassed the claimed range of 330-450°C nor a preferred range of 150-350°C

that overlapped the claimed range by 20°C described the claimed range with the requisite "sufficient specificity" to be anticipatory. That is, the Federal Circuit concluded there was no anticipation even though the prior art's broad range completely encompassed the claimed range and the preferred range overlapped about 17% of the claimed range. Moreover, sufficient specificity was lacking since the claimed range tended toward the upper end of the broadest disclosed range in the prior art, while the preferred range in the prior art tended toward the lower end of the broadest prior art range.

In the present case, the concentration ranges of the broadest embodiments disclosed in the references are such that the overlap between the disclosed alloys and the claimed alloys is only about 9%. The prior art's *preferred* concentration ranges are such that the disclosed preferred alloys overlap only about 4% of the claimed alloys. With respect to the zinc concentration specifically, the broad and preferred ranges disclosed in Ichikawa et al. tend toward lower zinc concentrations, while applicants' claimed zinc range requires high zinc concentrations. Applicants respectfully submit that since the broadest embodiments disclosed in the references overlap only about 9% of the claimed alloys (compared to the complete overlap of the broad range in *Atofina*) and the preferred embodiments of the cited references overlap only 4% of the claimed alloys (compared to the overlap of 17% of the preferred range in *Atofina*) and since Ichikawa et al.'s zinc concentration ranges tend toward lower zinc concentrations while the claimed zinc range tends toward higher zinc concentrations, the cited references fail to disclose the claimed alloy with the sufficient specificity required by *Atofina*. In view thereof, the cited references do not anticipate the alloys defined by

claim 1, and applicants respectfully request the rejections be withdrawn.

It is additionally significant that Ichikawa et al.'s method of depositing the Pt-Fe-Zn alloy onto the support is not able to control the final composition of the alloy itself such that Ichikawa et al. do not enable the claimed Pt-Fe-Zn alloy having a minimum iron concentration of at least 20 atomic % in combination with a minimum zinc concentration of at least 15 atomic %. In this regard, the concentrations of the components in the final alloy product are not correlated in any way with the amounts of Pt, Fe, and Zn reactant salts that are loaded onto the support. Therefore, the ordinarily skilled person is provided no guidance on how to prepare a desired alloy having predetermined component concentrations based on Ichikawa et al.'s method. The following table shows the atomic % of Pt, Fe, and Zn loaded onto the support:

Atomic % of each component loaded

Example	Iron (atomic %)	Zinc (atomic %)	Platinum (atomic %)
1	Loaded: 34.35	Loaded: 9.57	Loaded: 56.08
	Actual: 7.16	Actual: 14.27	Actual: 78.57
2	Loaded: 34.35	Loaded: 9.57	Loaded: 56.08
	Actual: 7.72	Actual: 14.21	Actual: 78.06
Comparative 1	Loaded: 34.35	Loaded: 9.57	Loaded: 56.08
	Actual: 14.62	Actual: 13.69	Actual: 71.70
Comparative 3	Loaded: 34.35	Loaded: 9.57	Loaded: 56.08
	Actual: 2.27	Actual: 8.31	Actual: 89.42
3	Loaded: 35.42	Loaded: 6.59	Loaded: 57.93
	Actual: 12.35	Actual: 13.49	Actual: 74.16
4	Loaded: 35.42	Loaded: 6.59	Loaded: 57.93
	Actual: 7.52	Actual: 12.85	Actual: 79.63

Comparative 4	Loaded: 35.42	Loaded: 6.59	Loaded: 57.93
	Actual: 3.20	Actual: 9.03	Actual: 87.76
Comparative 5	Loaded: 9.08	Loaded: 10.89	Loaded: 80.02
	Actual: 3.23	Actual: 20.35	Actual: 76.42
Comparative 6	Loaded: 50.98	Loaded: 14.35	Loaded: 34.68
	Actual: 10.06	Actual: 22.53	Actual: 67.41
Comparative 7	Loaded: 11.66	Loaded: 9.02	Loaded: 79.32
	Actual: 1.86	Actual: 13.63	Actual: 83.06
Comparative 8	Loaded: 20.05	Loaded: 25.39	Loaded: 54.56
	Actual: 4.74	Actual: 25.25	Actual: 70.01
5	Loaded: 27.01	Loaded: 6.84	Loaded: 66.15
	Actual: 4.59	Actual: 13.84	Actual: 81.85
6	Loaded: 57.12	Loaded: 4.02	Loaded: 38.86
	Actual: 69.66	Actual: 6.83	Actual: 23.51
7	Loaded: 42.30	Loaded: 5.89	Loaded: 51.80
	Actual: 13.11	Actual: 13.63	Actual: 73.26
8	Loaded: 37.03	Loaded: 2.50	Loaded: 60.46
	Actual: 8.47	Actual: 6.17	Actual: 85.36
9	Loaded: 48.98	Loaded: 1.03	Loaded: 49.98
	Actual: 31.83	Actual: 2.04	Actual: 66.13
10	Loaded: 48.24	Loaded: 2.55	Loaded: 49.22
	Actual: 30.54	Actual: 6.19	Actual: 63.27
11	Loaded: 47.04	Loaded: 4.96	Loaded: 47.99
	Actual: 29.31	Actual: 10.15	Actual: 60.54
12	Loaded: 35.48	Loaded: 6.59	Loaded: 57.93
	Actual: 7.16	Actual: 14.27	Actual: 78.57
13	Loaded: 35.48	Loaded: 6.59	Loaded: 57.93
	Actual: 7.16	Actual: 14.27	Actual: 78.57

The lack of predictability between the iron content in the final alloy as compared to the iron-based reactant loaded onto

the support is especially notable. In nearly every instance, the iron reactant loaded onto the support is drastically higher than the iron concentration in the final alloy. It appears therefore that even if Ichikawa et al.'s disclosure would have given the ordinarily skilled person with a reason to attempt to prepare Pt-Zn-Fe with iron contents above the claimed minimum of 20 atomic %, Ichikawa et al.'s methods are generally unsuccessful in accomplishing such an alloy.

In the few examples wherein the iron content is higher than 20 atomic %, such as Example 6, the zinc content is substantially lower than the claimed minimum of 15 atomic %. In this regard, it is apparent Ichikawa et al.'s methods fail to enable the ordinarily skilled person to prepare Pt-Zn-Fe alloys in which both the iron concentration is at least 20 atomic % and the zinc concentration is at least 15 atomic %. The Federal Circuit has stated that "even if the claimed invention is disclosed in a printed publication, **that disclosure will not suffice as prior art if it was not enabling.**" *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985), citing *In re Borst*, 345 F.2d 851, 855, 145 USPQ 554, 557 (CCPA 1965). Additionally, as endorsed by MPEP §2121 and the Federal Circuit's recent opinion in *Impax Laboratories, Inc. v. Aventis Pharmaceuticals Inc.*, 88 USPQ2d 1381 (Fed. Cir. 2008), the standard is whether the prior art reference enables the ordinarily skilled person to make the claimed invention without undue experimentation. See 88 USPQ2d at 1383:

In order to anticipate a claimed invention, a prior art reference must enable one of ordinary skill in the art to make the invention without undue experimentation. *Finisar Corp. v. DirectTV Group, Inc.*, 523 F.3d 1323, 1336 [86 USPQ2d 1609] (Fed. Cir. 2008) (citing *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1379 [82 USPQ2d 1643] (Fed. Cir. 2007)). In other

words, the prior art must enable the claimed invention. Minn. Mining & Mfg. Co. v. Chemque, Inc. (3M), 303 F.3d 1294, 1301 [64 USPQ2d 1270] (Fed. Cir. 2002).

Herein, it is apparent that enablement is lacking since Ichikawa et al.'s method cannot control the component concentrations of the final alloy and Ichikawa et al. did not provide a single method capable of producing an alloy having the combination of the claimed minimum iron and zinc concentrations. Moreover, it is apparent that significant experimentation would be required if the ordinarily skilled person were to start with Ichikawa et al.'s disclosure in order to arrive at a preparation method that is sufficient to prepare a Pt-Zn-Fe alloys which both the iron concentration is at least 20 atomic % and the zinc concentration is at least 15 atomic %. Since Ichikawa et al. do not enable the claimed alloy, the Federal Circuit's jurisprudence compels the conclusion that Ichikawa et al.'s disclosure is not sufficient to show that the claims are anticipated.

Claims 2, 6, and 14 depend from claim 1 and are patentable for the same reasons as claim 1 and by virtue of the additional requirements therein. Claims 3-5 have been canceled.

The concentration ranges in claim 6 have been narrowed to further distinguish the alloys defined therein from the prior art. That is, the concentration ranges disclosed in the cited references overlap even less the concentration ranges of claim 6.

Claim 14 is directed to an alloy comprising a concentration of platinum that is between about 40 and about 60 atomic percent, a concentration of zinc that is between about 15 and about 30 atomic percent, and a concentration of iron that is between about 25 and about 50 atomic percent. Claim 14 is not anticipated by the cited references since claim 14's platinum,

zinc, and iron concentration ranges are significantly narrower than those disclosed in the cited references such that the cited references do not disclose these concentration ranges with sufficient specificity as required by *Atofina* to be an anticipating disclosure. Moreover, the alloy defined by claim 14 is novel over the cited references since none of the Examples disclosed therein meet the claimed minimum concentrations of at least 15 atomic % for zinc and at least 25 atomic % for iron.

CONCLUSION

In view of the foregoing, applicants respectfully request reconsideration and allowance of the pending claims.

Applicants do not believe that a fee is required for the filing of this response, as it is being submitted within the three month shortened statutory period for reply. Should applicants be incorrect, the Commissioner is hereby authorized to charge the necessary fee to Deposit Account No. 19-1345.

Respectfully submitted,

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